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RE: Application No. 10/625,717
In re application of: Mark A. Toffle, et al.
Assignee: SEAGATE TECHNOLOGY LLC
Dkt. No.: STL-10953

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Transmission by Facsimile on April 20, 2007

Practitioner's Docket No. STL10953
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Mark A. Toffle, Xu Zuo, Brent M. Weichelt, and Louis J. Fioravanti

Application No.: 10/625,717

Group No.: 2627

Filed: 07/23/2003

Examiner: Brian Miller

For: SERVO TRACK WRITER WITH HELIUM BEARING

Mail Stop Appeal Briefs - Patents

Commissioner for Patents

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TRANSMITTAL OF APPEAL BRIEF
(PATENT APPLICATION--37 C.F.R. § 41.37)

1. Transmitted herewith, is the APPEAL BRIEF in this application, with respect to the Notice of Appeal filed on July 5, 2006.

2. STATUS OF APPLICANT

This application is on behalf of other than a small entity.

CERTIFICATION UNDER 37 C.F.R. §§ 1.8(a) and 1.10*

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37 C.F.R. § 1.8(a)

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Shelley D. McCarthy
Signature

Date: April 20, 2007

Shelley D. McCarthy

(type or print name of person certifying)

* Only the date of filing (' 1.6) will be the date used in a patent term adjustment calculation, although the date on any certificate of mailing or transmission under ' 1.8 continues to be taken into account in determining timeliness. See ' 1.703(f). Consider "Express Mail Post Office to Addressee" (' 1.10) or facsimile transmission (' 1.6(d)) for the reply to be accorded the earliest possible filing date for patent term adjustment calculations.

Transmittal of Appeal Brief--page 1 of 2

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3. FEE FOR FILING APPEAL BRIEF

Pursuant to 37 C.F.R. § 41.20(b)(2), the fee for filing the Appeal Brief is:

other than a small entity \$500.00

Appeal Brief fee due \$500.00

4. EXTENSION OF TERM

The proceedings herein are for a patent application and the provisions of 37 C.F.R. § 1.136 apply.

Applicant believes that no extension of term is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.

5. TOTAL FEE DUE

The total fee due is:

Appeal brief fee \$500.00

Extension fee (if any) \$0.00

TOTAL FEE DUE \$500.00

6. FEE PAYMENT

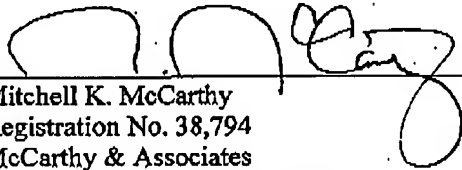
Authorization is hereby made to charge the amount of \$500.00 to Credit card as shown on the attached credit card information authorization form PTO-2038.

7. FEE DEFICIENCY

If any additional extension and/or fee is required, and if any additional fee for claims is required, charge Deposit Account No. 50-4124.

Date:

4/20/2007



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Transmittal of Appeal Brief—page 2 of 2

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Transmission by Facsimile on April 20, 2007

PATENT
Dkt. STL10953

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Mark A. Toffle, Xu Zuo, Brent M. Weichelt and Louis J.
Fioravanti

Assignee: SEAGATE TECHNOLOGY LLC

Application No.: 10/625,717

Group Art: 2627

Filed: July 23, 2003

Examiner: Brian Miller

For: SERVO TRACK WRITER WITH HELIUM BEARING

Mail Stop Appeal Brief - Patents

Commissioner for Patents

P. O. Box 1450

Alexandria, Virginia 22313-1450

ATTENTION: Board of Patent Appeals and Interferences

Sir:

APPELLANT'S BRIEF

This Brief is in furtherance of the Notice of Appeal filed on July 5, 2006 and following the "Pre-Brief Panel's"¹ Decision of March 20, 2007. The required fees, any required petition for extension of time for filing this Brief, and the authority and time limits established by the Notice of Appeal are dealt with in the accompanying TRANSMITTAL OF APPEAL BRIEF.

CERTIFICATION UNDER 37 C.F.R. §§ 1.8(a) and 1.10*

I hereby certify that, on the date shown below, this correspondence is being:

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Shelley D. McCarthy
Signature

Date:

April 20, 2007

Shelley D. McCarthy

(type or print name of person certifying)

¹ Applicant believes that this case did not receive the completely objective consideration intended by a Pre-Brief Panel review, because the designated Panel participants were only the Primary Examiner Mr. Miller and his Supervisor Ms. Nguyen.

This brief contains these items under the following headings, and in the order set forth below:

- I. REAL PARTY IN INTEREST
- II. RELATED APPEALS AND INTERFERENCES
- III. STATUS OF CLAIMS
- IV. STATUS OF AMENDMENTS
- V. SUMMARY OF CLAIMED SUBJECT MATTER
- VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL
- VII. ARGUMENT
- VIII. CLAIMS APPENDIX
- IX. EVIDENCE APPENDIX
- X. RELATED PROCEEDINGS APPENDIX

I. REAL PARTY IN INTEREST

The real party in interest in this application is Seagate Technology LLC. An Assignment, whereby the inventors assigned all rights in the above-referenced application to Seagate Technology LLC, was recorded by the U.S. Patent and Trademark Office on February 5, 2004 at Reel 014966, Frame 0093.

II. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

III. STATUS OF CLAIMS

The status of the claims in this application is:

| <u>Claim</u> | <u>Status</u> |
|---------------|-----------------------|
| 1. (Original) | Independent. |
| 2. (Original) | Depends from claim 1. |
| 3. (Original) | Depends from claim 1. |
| 4. (Original) | Depends from claim 1. |
| 5. (Original) | Depends from claim 1. |
| 6. (Original) | Depends from claim 5. |
| 7. (Original) | Depends from claim 1. |
| 8. (Original) | Depends from claim 1. |

| | |
|----------------------------|------------------------|
| 9. (Original) | Depends from claim 1. |
| 10. (Original) | Depends from claim 1. |
| 11. (Original) | Independent. |
| 12. (Original) | Depends from claim 11. |
| 13. (Original) | Depends from claim 11. |
| 14. (Original) | Depends from claim 11. |
| 15. (Original) | Depends from claim 11. |
| 16. (Original) | Depends from claim 15. |
| 17. (Original) | Depends from claim 11. |
| 18. (Original) | Depends from claim 17. |
| 19. (Original) | Depends from claim 11. |
| 20. (Original) | Depends from claim 11. |
| 21. (Previously presented) | Independent. |

A. TOTAL NUMBER OF CLAIMS IN APPLICATION

Claims in the application: 1-21.

B. STATUS OF ALL THE CLAIMS

1. Claims canceled: none
2. Claims withdrawn from consideration but not canceled: none
3. Claims pending: 1-21
4. Claims allowed: none
5. Claims rejected: 1-16, 18-21.
6. Claims objected to: 17

C. CLAIMS ON APPEAL

Claims now on appeal: 1-16, 18-21.

IV. STATUS OF AMENDMENTS

In the final rejection of 4/25/2006 the Examiner stated that the independent claims would require more structural definition in order to reach agreement on the meaning of the claim term "gas-lubricated bearing" urged by Applicant. Applicant immediately responded with amendments to that end in its Response filed 6/5/2006, in an effort to obviate the rejection or place the claims in better condition for appeal. However, those amendments

were not entered for allegedly raising new issues requiring further consideration or searching.
(Advisory Action of 6/15/2006)

V. SUMMARY OF CLAIMED SUBJECT MATTER

Embodiments of the present invention as recited by the language of independent claim 21 contemplate a gas-lubricated bearing (such as the actuator bearing of FIG. 20 and the spindle bearing of FIG. 21) with a working fluid comprising helium (see pg. 10 lines 6-10).

Embodiments of the present invention as recited by the language of independent claim 1 contemplate a servo track writer assembly (such as 200) for recording servo pattern information on a disc (such as 108). The servo track writer assembly has a spindle assembly (such as 206) having a hub (such as 228) supporting the disc and a spindle motor (such as 700, see FIG. 21) for rotating the hub. The servo track writer assembly also has an actuator assembly (such as 202) having an actuator arm (such as 224) supported by an actuator bearing (such as 600, see FIG. 20) for positioning the actuator arm relative to the disc. At least one of or both the spindle motor and the actuator bearing comprises a gas-lubricated bearing with a working fluid comprising helium (see pg. 10 lines 6-10). The servo track writer assembly also has a servo recording head (such as 204) supported by the actuator arm relative to the disc to record the servo pattern information on the disc as the spindle motor rotates the disc and the actuator bearing positions the actuator arm (see pg. 9 lines 6-8).

Embodiments of the present invention as recited by the language of claims depending from claim 1 contemplate the gas-lubricated bearing being a hydrostatic bearing (see pg. 14 lines 25-26). Alternatively, the gas-lubricated bearing can be a hydrodynamic bearing (see

pg. 14 lines 27-31). In any event, working fluid preferably is at least 70% helium by volume (see pg. 12 lines 10-21).

The gas-lubricated bearing has a gap between opposing bearing surfaces (such as 620, 622, 624 and 720, 722, 724, 726), with a gas inlet (such as 608, 740) and a gas outlet (such as 610, 748) coupled to the gap. A helium gas source (such as 500) can be coupled to the gas inlet through a pressure regulator (such as 502, 505; see pg. 12 lines 22-28), and a helium gas recovery tank (such as 510) can be coupled to the gas outlet (see pg. 12 line 31 to pg. 13 line 2).

The spindle motor can be a dedicated servo track writing spindle motor that is external to a disc drive in which the disc is to be installed (such as 206, see FIG. 2; pg. 7 lines 4-9). Alternatively, the spindle motor can be mounted within a disc drive (such as 100) in which the disc is installed (such as 106, see FIG. 1).

Embodiments of the present invention as recited by the language of independent claim 11 contemplate a method for recording servo pattern information on a disc (see FIGS. 22 and 23). The method begins with positioning the disc on a hub of a spindle motor (such as 801, 901). The spindle motor is then activated to rotate the disc (such as 802, 903). A servo recording head is then positioned at a desired radial position on the disc with an actuator having an actuator bearing (such as 804, 904). Signals are then sent to the servo recording head to record the servo pattern information on the disc (such as 804, 905). During the method, a separation of opposing bearing surfaces within at least one of or both the spindle motor and the actuator bearing is maintained by a working fluid of helium (such as 805, 906).

Embodiments of the present invention as recited by the language of claims depending from claim 11 contemplate performing the method either on a dedicated servo track writer

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assembly (such as 200) prior to installation of the disc (such as 108) within a disc drive (such as 100), or alternatively performing the method following installation of the disc within the disc drive (see pg. 7 lines 4-9). In any event, preferably the working fluid is at least 70% helium by volume (see pg. 12 lines 10-21).

The gas-lubricated bearing can be characterized as a hydrostatic bearing, the method further including pumping helium into a gap between the opposing bearing surfaces at a predetermined pressure (see pg. 14 lines 25-27). Alternatively, the gas-lubricated bearing can be characterized as a hydrodynamic bearing, the method further including supplying helium to a gap between the opposing bearing surfaces and maintaining separation of the opposing bearing surfaces through a self-pumping action within the gas-lubricated bearing (see pg. 14 lines 27-31). The method can also include recovering the helium from the gap through an exhaust port in the gas-lubricated bearing (such as 806, 907).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1-16 and 18-21 stand rejected under Section 103 as being unpatentable over U.S. Patent No. 6,178,059 to Frees (Frees '059) in view of U.S. Patent No. 6,674,189 to Watanabe (Watanabe '189).

VII. ARGUMENT

THE OBVIOUSNESS REJECTION OF INDEPENDENT CLAIMS 1, 11, AND 21 IS CLEAR ERROR BECAUSE THERE IS NO EVIDENCE IN THE RECORD THAT FREES '059 OR WATANABE '189 SUBSTANTIATES A CASE OF OBVIOUSNESS

Claim 11

Claim 11 recites in pertinent part:

The inner race and the outer race of each of the roller bearings 3a, 3b, 4 define the opposing bearing surfaces. That is, for example, the bearing 3b has its outer race fixed to the housing 2 and its inner race fixed in rotation with the spindle 5. Importantly, a plurality of the ball bearings maintain separation between the bearing surfaces. Watanabe '189 does not teach or suggest anything separating the bearing surfaces other than the contacting engagement of the ball bearings. The Examiner has not provided any evidence in the record that Watanabe '189 teaches or suggests maintaining separation of opposing bearing surfaces with a working fluid in a gas-lubricated bearing as claimed.

A case of obviousness also requires at least some degree of predictability that a reasonable expectation of success exists in combining the cited references to arrive at the claimed embodiments. *In re Rinehart*, 189 USPQ 143 (CCPA 1976). However, the Examiner has substantiated no evidence whatsoever in predicting the success. At a minimum, the Examiner is obligated to show evidence as to why the skilled artisan would find the roller bearings of Watanabe '189 to be superfluous.

Moreover, a case of obviousness also requires some suggestion or motivation, either in the references themselves or in the knowledge of the skilled artisan, to modify and/or combine the cited references to arrive at the invention as claimed. This motivation must be found in the prior art, and not be based on applicant's disclosure. *In re Vaack*, 20 USPQ2d 1438 (Fed. Cir. 1991). Given the subtle but powerful attraction of a hindsight-based obviousness analysis, a rigorous application of the requirement of an evidentiary basis for the motivation must be followed. *In re Dembiczak*, 175 F.3d 994, 999 (Fed. Cir. 1999).

The Examiner's basis for the requisite motivation is that because Watanabe '189 teaches injecting helium into the gap between the housing and the spindle, it then would be within the knowledge of the skilled artisan to use helium in any bearing assembly including

that of Frees '059. However, as discussed, Frees '059 is entirely silent regarding its bearing construction and Watanabe '189 only discloses a roller bearing construction. The Examiner has not substantiated any evidence of motivation to replace the roller bearings in Watanabe '189 with a gas-lubricated bearing (fluid bearing) of the claimed embodiments.

Obviousness under Section 103 is a legal conclusion based on underlying findings of fact. *In re Kotzab*, 217 F.3d 1365, 1369 (Fed. Cir. 2000). The Board must find in the underlying facts "substantial evidence" that adequately supports the Examiner's position that even a *prima facie* case of obviousness has been made. *In re Gartside*, 203 F.3d 1305, 1316 (Fed. Cir. 2000). This approach is consonant with the Office's obligation to develop an evidentiary basis for its factual findings to allow for judicial review under the substantial evidence standard that is both deferential and meaningful. *see In re Lee*, 277 F.3d 1338, 1344 (Fed. Cir. 2002).

In this case the fact is clear that the cited references do not, neither alone nor in combination, teach or suggest *maintaining separation of opposing bearing surfaces with a working fluid in a gas-lubricated bearing* as claimed. Furthermore, the fact is clear that the Examiner has not substantiated any evidence of motivation to replace the roller bearings of Watanabe '189 with the gas-lubricated bearings of the claimed embodiments and expectation of success in doing so.

Accordingly, the Section 103 rejection is clear error because the facts form determinative evidence that there is lacking in the record the requisite teaching or suggestion by the cited references, individually or collectively, of all the features of the present embodiments as recited by the language of claim 11. There is also lacking in the record the requisite expectation of success and motivation to the skilled artisan to modify the cited

references to arrive at the present embodiments of claim 11. For these reasons, the final rejection of claim 11, as well as the claims depending therefrom, should be reversed.

Claims 1 and 21

Claims 1 and 21 recite in pertinent parts:

*a spindle assembly having...a spindle motor for rotating the hub;
an actuator assembly having...an actuator bearing...wherein at least one of the spindle motor and the actuator bearing comprises a gas-lubricated bearing with a working fluid comprising helium....
(excerpt of claim 1, emphasis added)*

*A gas-lubricated bearing with a working fluid comprising helium.
(claim 21, emphasis added)*

The language of claim 11 expressly defines a *gas-lubricated bearing* as a type characteristically having a working fluid maintaining separation of opposing bearing surfaces. This express meaning of *gas-lubricated bearing* is consistent with the term's usage throughout the specification, such as for example:

FIG. 20 is a cross-sectional view of bearing portion 600 shown in FIG. 19... The mating surfaces between stator 602 and the elements of rotor 604 form radial bearing surfaces 620 and axial bearing surfaces 622 and 624. These bearing surfaces are separated from one another by a small gap. During operation, the gap is maintained by the lubricating gas... Inlet 608 is coupled to conduit 506 (shown in FIG. 19) for receiving helium gas at a desired pressure from source tank 500. The helium gas passes from inlet 608 into passageway 625 and then along bearing surfaces 620, 622 and 624, as indicated by arrows 626.

FIG. 21 is a cross-sectional view of a helium gas lubricated spindle motor 700... Rotor 704 has a main body portion 712 and a thrust flange 714, which rotate about axis 706. The outer surfaces of rotor 704 and the opposing surfaces of stator 702 are spaced from one another by a small gap, which forms a gas-lubricated bearing having

radial bearing surfaces 720 and 722 and axial bearing surfaces 724 and 726... Spindle motor 700 further includes a gas inlet 740 for receiving helium gas from conduit 504 (shown in FIG. 18). Inlet 740 is coupled to the gaps between bearing surfaces 720, 722, 724 and 726 through an inlet passageway 742.

In the embodiments shown in FIGS. 19-21, the spindle motor and actuator motor are configured with hydrostatic gas-lubricated bearings, which use an external pressurized fluid source to maintain bearing surface separation. In an alternative embodiment, either or both of the spindle motor and the actuator motor can be configured as a hydrodynamic bearing, which generates a self-pumping pressure internal to the bearing in order to maintain the bearing surface separation. (specification pg. 13 line 10 to pg. 14 line 31, emphasis added)

Where different claims use common language, the common language is given the same effect in each claim. *Innova/Pure Water, Inc. v. Safari Water Filtration Systems, Inc.*, 381 F.3d 1111 (Fed. Cir. 2004), *reaffirmed in Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). The Examiner has substantiated no evidence showing why it would be reasonable to construe *gas-lubricated bearing* as being a fluid bearing in claim 11, where the bearing surfaces are separated by the working fluid, but as a roller bearing in claims 1 and 21, where the bearing surfaces are not separated by the working fluid. Absent such evidence, by law the meaning of *gas-lubricated bearing* in claims 1 and 21 is limited to the type defined in claim 11 as characteristically having a working fluid maintaining a separation between opposing bearing surfaces.

Accordingly, for the same reasons set forth for claim 1 above, the Section 103 rejection is clear error because the facts form determinative evidence that there is lacking in the record the requisite teaching or suggestion by the cited references, individually or collectively, of all the features of the present embodiments as recited by the language of claims 1 and 21. There is also lacking in the record the requisite expectation of success and

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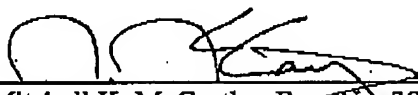
motivation to the skilled artisan to modify the cited references to arrive at the present embodiments of claims 1 and 21. For these reasons, the final rejection of claims 1 and 21, as well as the claims depending therefrom, should be reversed.

Conclusion

In conclusion, Applicant respectfully requests that the rejection of all pending claims be reversed.

Respectfully submitted,

By:



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VIII. CLAIMS APPENDIX

1. (Original) A servo track writer assembly for recording servo pattern information on a disc, the assembly comprising:
 - a spindle assembly having a hub supporting the disc and a spindle motor for rotating the hub;
 - an actuator assembly having an actuator arm supported by an actuator bearing for positioning the actuator arm relative to the disc, wherein at least one of the spindle motor and the actuator bearing comprises a gas-lubricated bearing with a working fluid comprising helium; and
 - a servo recording head supported by the actuator arm relative to the disc to record the servo pattern information on the disc as the spindle motor rotates the disc and the actuator bearing positions the actuator arm.
2. (Original) The servo track writer assembly of claim 1 wherein the spindle motor comprises the gas-lubricated bearing with the working fluid comprising helium.
3. (Original) The servo track writer assembly of claim 1 wherein the actuator bearing comprises the gas-lubricated bearing with the working fluid comprising helium.
4. (Original) The servo track writer assembly of claim 1 wherein:
 - the spindle motor comprises the gas-lubricated bearing with the working fluid comprising helium; and

the actuator bearing comprises a further gas-lubricated bearing with a working fluid comprising helium.

5. (Original) The servo track writer assembly of claim 1 wherein the gas-lubricated bearing comprises a hydrostatic bearing comprising a gap between opposing bearing surfaces in the bearing and a gas inlet and a gas outlet, which are coupled to the gap.

6. (Original) The servo track writer assembly of claim 5 and further comprising:
a helium gas source coupled to the gas inlet through a pressure regulator; and
a helium gas recovery tank coupled to the gas outlet.

7. (Original) The servo track writer assembly of claim 1 wherein the gas-lubricated bearing comprises a hydrodynamic bearing.

8. (Original) The servo track writer assembly of claim 1 wherein the working fluid comprises at least 70% helium by volume.

9. (Original) The servo track writer assembly of claim 1 wherein the spindle motor is a dedicated servo track writing spindle motor that is external to a disc drive in which the disc is to be installed.

10. (Original) The servo track writer assembly of claim 1 wherein the spindle motor is mounted within a disc drive in which the disc is installed.

11. (Original) A method for recording servo pattern information on a disc, the method comprising:

- (a) positioning the disc on a hub of a spindle motor;
- (b) activating the spindle motor to rotate the disc;
- (c) positioning a servo recording head relative to a desired radial position on the disc with an actuator having an actuator bearing;
- (d) signaling the servo recording head to record the servo pattern information on the disc; and
- (e) maintaining separation of opposing bearing surfaces with a working fluid in a gas-lubricated bearing within at least one of the spindle motor and the actuator bearing during (d), wherein the working fluid comprises helium.

12. (Original) The method of claim 11 wherein (e) comprises maintaining separation of opposing bearing surfaces with helium within the spindle motor during (d).

13. (Original) The method of claim 11 wherein (e) comprises maintaining separation of opposing bearing surfaces with helium within the actuator bearing during (d).

14. (Original) The method of claim 11 wherein (e) comprises maintaining separation of opposing bearing surfaces with helium within both the spindle motor and the actuator bearing during (d).

15. (Original) The method of claim 11 wherein the gas-lubricated bearing comprises a hydrostatic bearing and (e) comprises pumping the helium into a gap between the opposing bearing surfaces at a predetermined pressure during (d).

16. (Original) The method of claim 15 and further comprising:

(f) recovering the helium from the gap through an exhaust port in the gas-lubricated bearing.

17. (Original) The method of claim 11 wherein the gas-lubricated bearing comprises a hydrodynamic bearing and (e) comprises supplying the helium to a gap between the opposing bearing surfaces prior to (d) and maintaining separation of the opposing bearing surfaces through a self-pumping action within the gas-lubricated bearing.

18. (Original) The method of claim 11 wherein the working fluid comprises at least 70% helium by volume.

19. (Original) The method of claim 11 wherein steps (a) through (e) are performed on a dedicated servo track writer assembly prior to installation of the disc within a disc drive.

20. (Original) The method of claim 11 wherein steps (b) through (e) are performed following installation of the disc within a disc drive.

21. (Previously presented) A gas-lubricated bearing with a working fluid comprising helium.

IX. EVIDENCE APPENDIX

No additional evidence is included.

X. RELATED PROCEEDINGS APPENDIX

There exist no relevant related proceedings concerning this Appeal before the Board.